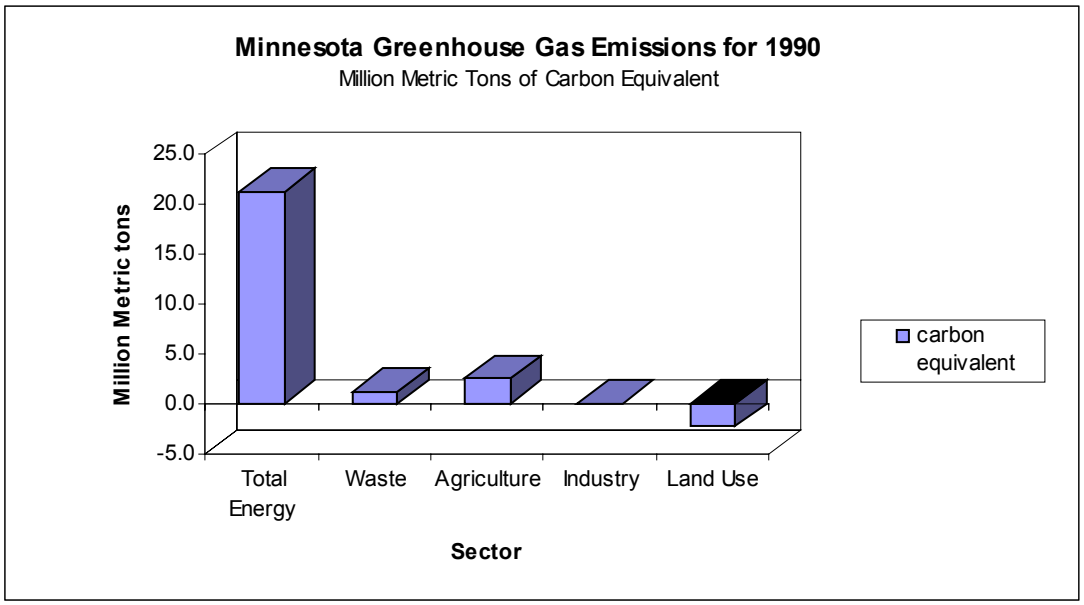
MINNESOTA GREENHOUSE GAS EMISSIONS AND SINKS INVENTORY: SUMMARY



The report "*Minnesota Greenhouse Gas Inventory 1990*" provides a detailed inventory of greenhouse gas emissions and sinks for Minnesota in 1990. Emissions were estimated using methods from EPA's 1992 guidance document ***State Workbook: Methodologies for Estimating Greenhouse Gas Emissions***. In 1990, Minnesota emitted 22.5 million metric tons of carbon equivalent (MMTCE). Minnesota estimated emissions of more than 1.5 MMTCE from biomass fuels and from other sources as well as 6.8 MMTCE of emissions from ozone-depleting substances (ODS) from the use of infrared-absorbing halogenated substances. Emissions from these sources are not included in the reported total or the table below.[1,2]

The principal greenhouse gases were carbon dioxide, comprising 67.8 million metric tons (18.5 MMTCE), and methane, with 0.5 million metric tons (2.8 MMTCE). Other emissions included over 14,000 metric tons of nitrous oxide (1.2 MMTCE).

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[1] Note that the state of the art emission inventory method has advanced since Minnesota completed its inventory; therefore, we have made the following adjustments to Minnesota's emission estimates. First, we excluded emission estimates for sources not covered by the most recent inventory guidance (http://www.epa.gov/ttnchie1/eiip/techrep.htm#green). These emissions include carbon dioxide emissions from other fossil fuel combustion, air pollution control at power plants, non-fuel uses of fossil fuels, manufacture of fertilizer, natural gas and oil systems; and emissions of various ozone-depleting compounds. Second, we used updated carbon coefficients for some fuel types. Third, we used updated values for global warming potentials.

[2] The Minnesota inventory also estimates emissions of non-methane volatile organic compounds, nitrogen oxides, and carbon monoxide. These are greenhouse gases for which global warming potentials have not yet been developed.

Minnesota Greenhouse Gas Emissions for 1990

BY SECTOR	CO2 (MMTCE)	Methane (MMTCE)	Nitrous Oxide (MMTCE)	HFCs, PFCs, and SF6 (MMTCE)	Total GHG Emissions (MMTCE)
Energy - Residential	2.1	*	*	*	2.1
Energy - Commercial	1.4	*	*	*	1.4
Energy - Industrial	2.3	*	*	*	2.3
Energy - Transport	7.2	*	*	*	7.2
Energy - Utility	7.9	*	*	*	7.9
Energy - Exported Electricity	*	*	*	*	*
Energy - Other	*	0.2	0.2	*	0.5
Total Energy	**20.8**	**0.2**	**0.2**	*	**21.3**
Waste	**0.1**	**1.1**	**0.0**	*	**1.2**
Agriculture	**0.0**	**1.5**	**1.0**	*	**2.5**
Industry	**0.0**	*	*	*	**0.0**
Land Use	**-2.4**	*	*	*	**-2.4**
Total	**18.5**	**2.8**	**1.2**	*	**22.5**

All emissions are reported in million metric tons of carbon equivalent (MMTCE).

An asterisk (*) indicates that emissions of the gas from this sector were zero, insignificant, or not reported.

Emissions due to coal mining and extraction of natural gas and oil are included in the energy – other figures, and emissions from biofuel combustion are excluded.

The major source of carbon dioxide emissions was fossil fuel combustion (>99%), with minor emissions from waste combustion, limestone use, carbon dioxide manufacture, and agricultural soils (<1%). Of those carbon dioxide emissions from fossil fuel combustion, 79% were attributable to coal use for the utility sector and petroleum use for transportation. Carbon dioxide sinks (i.e., an increase in forest carbon storage) offset about 10% of the total carbon dioxide emissions. Contributors to methane emissions were landfills (39%), domesticated animals (39%), manure management (13%), natural gas and oil systems (7%), fossil fuel combustion (1.9%), and rice cultivation (<1%). The majority of nitrous oxide emissions were from fertilizer use (80%), with minor emissions from fossil fuel combustion (19%), and waste combustion (1%).

Minnesota emissions in 1990 were 5.1 MTCE per capita, compared to 1990 U.S. emissions of 6.4 MTCE per capita.